REMARKS:

1) Referring to item 10) of the Office Action Summary, please indicate the acceptance of the drawings filed on July 21, 2005.

2) Referring to item 12) of the Office Action Summary, please acknowledge the foreign priority claim, and receipt of the certified copy of the priority document, which was provided to the USPTO through the PCT handling of the counterpart PCT International Application.

3) The Examiner's attention is directed to applicant's Second Information Disclosure Statement being filed together with the present response. Please consider the cited references, and return an initialed, signed and dated acknowledgment copy of the IDS Form PTO-1449 of July 14, 2008.

4) In accordance with the PCT procedures, the original specification of this application was a direct literal translation of the foreign text of the corresponding PCT International Application. The written description and the abstract have now been amended in an editorial and formal manner, to better comply with typical US application format (e.g. with section headings), and to improve the use of art-recognized terminology in comparison to the original literally translated text. These merely editorial and formal amendments do not introduce any new matter. Entry thereof is respectfully requested.

5) Further according to the PCT procedures, the original claims of this application were a direct literal translation of the corresponding foreign language claims of the counterpart PCT International Application. The translated international claims have been canceled, and new claims 36 to 50 have been introduced, as a fresh approach at covering inventive subject matter of this application with a somewhat different claim format, style and terminology in comparison to the original translated PCT claims. The new claims 36 to 50 have been drafted to better conform to typical US claim style and practice. The new claims are supported by the original disclosure as shown in the following Table, and do not introduce any new matter. Entry and consideration of the new claims are respectfully requested.

new claims	36	37	38	39	40	41
original support	cl 1, 2, 19, 21, 32	cl 19; Figs. 1-4	cl 21; Figs. 1-4	cl 19, 21; Figs. 1-4	cl 25; Figs. 3, 4	cl 25; Figs. 3, 4, 5

new claims	42	43	44	45	46	47
original support	cl 22; Fig. 4	cl 22; Figs. 2, 4	cl 24; Fig. 2	Fig. 7; p 13 l 21- p 14 l 10	cl 35; Fig. 9; p 14 l 25- p 15 l 17	cl 35; Fig. 9; p 14 l 25 - p 15 l 17

new claims	48	49	50
original support	cl 34; Fig. 8; p 14 l 11 - 24	cl 34, 35; Figs. 8, 9; p 14 l 11- p 15 l 17	Fig. 9; p 14 l 25 - p 15 l 17

6) Referring to the top of page 2 of the Office Action, the objection to claim 28 for lack of proper antecedent basis has been obviated by the cancellation of claim 28. It is

respectfully submitted that the new claims 36 to 50 avoid such informalities. Thus, please withdraw the objection.

7) Referring to pages 2 to 4 of the Office Action, the rejection of claims 1, 2, 19 to 21, 23 to 25, 32, 34 and 35 as anticipated by US Patent 4,722,499 (Klug) is respectfully traversed.

Because the original claims have been canceled, this rejection will be discussed in connection with the new claims 36 to 50.

The lift and therewith also the induced drag being produced at any chord section of a lifting wing of an aircraft depends on (among other things) the local angle of attack of the lifting wing at this chord section. For a wing that is flexible or elastically deformable in a bending direction, and in a torsional direction about an elastic axis extending outwardly along the wing, the angle of attack of a given chord section of the wing varies depending on the elastic deformation of the wing, both in bending and in torsion. It has been found that the lift distribution and therewith also the induced drag distribution over the span of the wing can be influenced by bending and/or twisting the wing. Particularly, it has been found that such purposeful twisting of the wing can be achieved most effectively by a control surface that is pivotably connected to the lifting wing so as to be pivotable about a pivot axis that extends non-perpendicularly to the elastic axis (i.e. having at least a direction component of the pivot axis extending parallel to the elastic axis), wherein further the control surface is located offset by a spacing distance (as large as possible) in front of

the elastic axis. This spacing distance forms a lever arm relative to the elastic axis, for the aerodynamic force generated by the control surface. By appropriately controlling the pivoting deflection of the control surface, the control surface exerts an aerodynamic force that elastically deforms the lifting wing in the bending direction and in the torsional direction about the elastic axis so as to vary the induced drag toward minimizing the induced drag. This is especially preferably achieved by elastically deforming the wing so as to produce an elliptical lift distribution over the span of the wing. Also, the effectiveness of the control surface positioned in front of the elastic axis is enhanced, because its pivoting deflection is amplified or supplemented by the resulting twisting deflection of the lifting wing.

Present new independent claim 36 recites particular elements of the invention for achieving the above features. Thus, claim 36 is directed to an aircraft wing construction including a lifting wing, a control surface pivotably connected to the lifting wing, and a control and/or regulating arrangement adapted to generate an actuating signal according to which the pivoting deflection of the control surface is actuated so as to vary the induced drag toward minimizing the induced drag. The control surface is pivotable about a pivot axis that extends non-perpendicular to the elastic axis and non-parallel to the wingtip edge of the lifting wing. This orientation of the pivot axis is important, so that a pivotal deflection of the control surface about this pivot axis will achieve the desired elastic deformation of the wing.

The Klug reference does not disclose all of the features of present claim 36. For example, according to present claim 36, the pivot axis of the control surface must extend non-perpendicular to the elastic axis and **non-parallel to the wingtip edge**. To the contrary, according to Klug, the winglets (4, 5) are pivotable about an axis (6) that extends parallel to the wingtip edge, and may additionally be pivotable about additional axes (7, 8, 12, 13) that extend non-perpendicular to the elastic axis and non-parallel to the wingtip edge. Nonetheless, the pivoting about the pivot axis (6) extending parallel to the wingtip edge is directly contrary to present claim 36.

The present dependent claims recite additional features that further distinguish the invention over the prior art for example as follows.

According to claim 37, the pivot axis of the control surface must extend parallel to the elastic axis and in front of the elastic axis. Contrary thereto, Klug does not disclose an arrangement of such a control surface with a pivot axis that is parallel to and in front of the elastic axis.

Present claim 38 requires that the pivot axis of the control surface is entirely in front of the elastic axis. Contrary thereto, Klug discloses a pivot axis (6) that extends in front of and behind the elastic axis, and discloses an additional pivot axis (8) that is entirely behind the elastic axis.

Present claim 39 requires that the pivot axis must extend on a line that is non-intersecting with the elastic axis.

Contrary thereto, the pivot axes (6, 7, 12) of Klug appear to intersect the elastic axis.

Present claim 40 requires the pivot axis of the control surface to be entirely in front of the leading edge of the wing. Contrary thereto, the pivot axes (6, 7, 8, 12, 13) in the arrangement according to Klug all extend and join the wing behind the leading edge of the wing.

According to present claim 41, the control surface must be entirely in front of the leading edge. Contrary thereto, while the winglet (4) of Klug extends partially in front of the leading edge, it is also partially behind the leading edge, and Klug does not disclose such a control surface that is entirely in front of the leading edge.

Present claim 42 depends from claim 41 and recites that the control surface is not only entirely in front of the leading edge, but also it extends only inwardly from and does not extend outwardly beyond a line extending along the wingtip edge of the lifting wing, in all pivoting deflection positions of the control surface. Such an arrangement of the control surface is exemplified in Fig. 4 of the present drawings, in which the control surface is entirely in front of the leading edge and inboard from the wingtip edge. The arrangements of Klug do not disclose such a position or location of the control surface. Such a control surface position has been found to be especially effective because of the long lever arm relative to the elastic axis and because of avoiding an increase of the effective total span of the wing plus control surface.

Present claim 43 recites the feature of claim 42 without depending from claim 41, so that it is exemplified by present Figs. 2 and 4, in which the control surface is inboard from the wingtip edge. Such arrangements are not disclosed by Klug, where instead the winglets (4, 5) extend outboard beyond the wingtip edge, which is disadvantageous for increasing the total span.

Present claim 44 depends from claim 43 and requires the control surface to extend entirely behind the leading edge without extending in front of the leading edge, while also being inboard from the wingtip edge. Such an arrangement is exemplified in present Fig. 2. Such an arrangement is not disclosed by Klug, where the winglets extend outboard beyond the wingtip edge and also forwardly ahead of the leading edge.

Present claim 45 recites that the control and/or regulation arrangement is adapted to generate the actuating signal for the control surface so as to achieve an elliptical distribution of lift over the lifting wing. This particular elliptical lift distribution, which achieves a minimized induced drag, is not disclosed by Klug.

According to present claim 46, the control and/or regulation arrangement includes a measurement unit adapted to measure an actual elastic deformation of the lifting wing. Klug does not disclose such a measurement unit.

Present claim 47 recites such a measurement unit as well as a further storage unit that stores desired nominal values representing a desired nominal deformation prescribed for given conditions, and a comparison unit adapted to compare the measured data with the desired nominal values and to output the actuating

signal dependent thereon. Klug does not disclose such comparison of measured data with stored desired nominal values to output the actuating signal.

Present claim 48 recites that the control arrangement comprises a storage unit that stores desired nominal values. In this regard, the Examiner has referred to col. 7 lines 59 to 68 of Klug, but the disclosed "preprogrammed priorities or permissible maximum values" are not desired nominal values, but rather priorities or maximum values acting as limits on the measured flight condition values.

Present claim 49 is a method claim depending from apparatus or device claim 36, and is directed to a method of using the apparatus or device according to claim 36. The particular method steps recited in claim 49 combine to achieve the above discussed features of the invention, culminating in a step of pivotally deflecting the control surface in accordance with an actuating signal so that the control surface exerts an aerodynamic force that elastically deforms the lifting wing so as to reduce the induced drag toward a minimum for a given aircraft load and flight condition. Claim 50 depends from claim 49 and recites further method features including a step of measuring an actual elastic deformation of the lifting wing and a step of comparing the corresponding measured data with the nominal values representing a desired nominal deformation of the lifting wing, and then deflecting the control surface until the measured data match the desired nominal values. Klug does not disclose such a regulating method in which the actual elastic deformation of the wing is measured and compared to nominal values for the

deformation, so that the control surface can be actuated until the actual deformation matches the desired nominal deformation.

For the above reasons, please withdraw the anticipation rejection based on Klug, because this rejection is not applicable against any of the present new claims 36 to 50.

8) Referring to pages 4 to 6 of the Office Action, the rejection of claims 1 and 26 to 31 as anticipated by Klug is respectfully traversed. The new claims 36 to 50 have been discussed above in comparison to Klug. The rejection of the original claims 1 and 26 to 31 has been obviated by the cancellation of those claims. For the reasons discussed above, Klug does not anticipate any of the present new claims. For these reasons, please withdraw this further anticipation rejection based on Klug.

9) Referring to page 6 of the Office Action, the rejection of claim 22 as obvious over Klug in view of US Patent 5,988,563 (Allen) is respectfully traversed.

Features from claim 22 have been recited in present new claims 42 and 43. These claims recite that the control surface extends only inwardly from and does not extend outwardly beyond a line extending along the wingtip edge of the lifting wing, in all pivoting deflection positions of the control surface. Such an arrangement of the control surface is exemplified in present Figs. 2 and 4. Such an arrangement is especially advantageous, because it does not increase the effective total span of the lifting wing plus the control surface in any deflection position of the control surface.

Contrary thereto, the arrangements disclosed by Klug all have the winglets protruding outwardly beyond the wingtip edge of the lifting wing.

Allen discloses an aircraft in which wingtip portions form foldable winglets that can be folded upwardly into a vertical position to reduce a bending moment and increase the aerodynamic efficiency of the wing. Nonetheless, such winglets also extend beyond the effective span of the main portion of the lifting wing itself when they are in the outwardly deployed position and are considered as additional winglets in the manner of Klug.

Thus, even a combined consideration of Klug and Allen would only have suggested to make the winglets of Klug to be pivotable into an upward vertical position, but still to have pivoting deflection positions that extend outboard beyond the wingtip edge. Even a combined consideration of the two references would not have made present new claims 42 and 43 obvious.

The Examiner is respectfully requested to withdraw the obviousness rejection based on Klug and Allen, because this rejection is not applicable against any of the present new claims for the above reasons.

10) Referring to page 7 of the Office Action, the rejection of claim 33 as obvious over Klug in view of US Patent 6,142,738 (Toulmay) is respectfully traversed. The rejection has been obviated by the cancellation of claim 33. All of the present new claims have been discussed above in comparison to Klug. The Examiner has additionally applied Toulmay for disclosing a blade of a rotary wing aircraft including a blade tip winglet. The new claims no

longer expressly recite a wing for a rotary wing aircraft. The teachings of Toulmay are not relevant to the present claims. Please withdraw the obviousness rejection applying Klug and Toulmay, as inapplicable against any of the present new claims.

11) Favorable reconsideration and allowance of the application, including all present claims 36 to 50, are respectfully requested.

Respectfully submitted,

WFF:he/4879
Enclosures:
Transmittal Cover Sheet
Term Extension Request
Form PTO-2038
Information Disclosure Statement
w. Form PTO-1449
3 references, 2 abstracts
postcard

By Walter F Fasse

Walter F. Fasse
Patent Attorney
Reg. No.: 36132
Tel. 207-862-4671
Fax. 207-862-4681
P. O. Box 726
Hampden, ME 04444-0726

CERTIFICATE OF MAILING:

I hereby certify that this correspondence with all indicated enclosures is being deposited with the U. S. Postal Service with sufficient postage as first-class mail, in an envelope addressed to: COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 on the date indicated below.

Walter F Fasse 7/14/08

Name: Walter F. Fasse - Date: July 14, 2008